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Docket No.: 5000-0187PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Jordi TORMO I BLASCO et al.

Application No.: 10/587,914

Confirmation No.: 3593

Filed: July 31, 2006

Art Unit: 1614

For: FUNGICIDAL MIXTURES

Examiner: Not Yet Assigned

LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Subsequent to the filing of the above-identified application on July 31, 2006, attached hereto are

- Form PCT/IB/373 (International Preliminary Report on Patentability (IPRP) (1 pg)
- Form PCT/ISA/237 (Written Opinion) (10 pgs)

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any

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additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: March 23, 2007

Respectfully submitted,

By 

Andrew D. Meikle

Registration No.: 32,868

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant

Attachment(s)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 0000055379	FOR FURTHER ACTION	See item 4 below
International application No. PCT/EP2005/001758	International filing date (<i>day/month/year</i>) 19 February 2005 (19.02.2005)	Priority date (<i>day/month/year</i>) 26 February 2004 (26.02.2004)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Date of issuance of this report 04 October 2006 (04.10.2006) Authorized officer <p style="text-align: center; font-weight: bold;">Agnes Wittmann-Regis</p> e-mail: pt06@wipo.int
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

TRANSLATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year) **See form PCT/ISA/210**

Applicant's or agent's file reference

0000055379

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/EP2005/001758

International filing date (day/month/year)

19.02.2005

Priority date (day/month/year)

26.02.2004

International Patent Classification (IPC) or both national classification and IPC

A01N43/90

Applicant

BASF AKTIENGESELLSCHAFT

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

This opinion has been established on the basis of a translation from the original language into the following language

_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☐

in written format

☐

in computer readable form

c. time of filing/furnishing

☐

contained in the international application as filed.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-10	YES
	Claims		NO
Inventive step (IS)	Claims	1-10	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims		NO
2. Citations and explanations:			
<p>The present opinion refers to the following citations (D1-D7) :</p> <p>D1: EP-A-0 988 790</p> <p>D2: WO 98/46607 A</p> <p>D3: EP-A-0 253 714</p> <p>D4: WO 99/31985 A</p> <p>D5: US-A-5 593 996</p> <p>D6: BUCHENAUER H: "Comparative studies on the antifungal activity of triadimefon, triadimenol, nuarimol, imazalil and fluotrimazole in vitro", Zeitschrift für Pflanzenkrankheiten und Pflanzenschutz, vol. 86, 6, 1979, pages 341-354, ISSN: 0340-8159</p> <p>D7: LATIJNHOUWERS MAITA ET AL: "Oomycetes and fungi: Similar weaponry to attack plants." Trends in Microbiology, vol. 11, 10, October 2003 (2003-10), pages 462-469, ISSN: 0966-842X</p> <p>Novelty</p> <p>The subject matter of claims 1-10 is novel under PCT Article 33(1) and (2).</p> <p>Independent claim 1 provides a fungicidal mixture</p>			

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citations and explanations supporting such statement

composed of a specific fungicidal triazolopyrimidine (referred to hereinafter as TP1) and fenarimol in a synergistically active amount. Claim 3 claims a composition which comprises a carrier and the mixture. The remaining independent claims 4, 9 and 10 are directed, respectively, to a method for controlling harmful fungi by means of such a mixture, to seed comprising such mixtures and to the use of the two compounds for preparing compositions for controlling harmful fungi.

None of the citations mentioned discloses the specific mixture which forms the subject matter of the present application.

D1 discloses (see the passages cited in the international search report) synergistic mixtures of triazolopyrimidines with other fungicides, also including fungicides which inhibit ergosterol synthesis, for example triazoles such as cyproconazole and metconazole, fenpropimorph and triforine, and the pyrimidine derivative pyrimethanil. TP1 is not mentioned specifically. The "azolopyrimidine C" used in the example (referred to hereinafter as TPc) is the 7-(1,1,1-trifluoroprop-2-ylamino) analogue of the azolopyrimidine TP1. Likewise mentioned as preferred in addition to TPc are an "azolopyrimidine A" (referred to hereinafter as TPa), which is the 2-chloro-6-fluorophenyl analogue of TP1, and an "azolopyrimidine B" (referred to hereinafter as TPb), which is the 7-(2,2,2-trifluoroethylamino) analogue of TPa.

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D2 discloses (see the passages cited in the international search report), *inter alia*, the compound TP1 and its activity against phytopathogenic fungi, for example *Uncinula necator* (powdery mildew of grapevines, *Erysiphales*, *Ascomycetes*). It is shown in a comparative example that TP1 is superior in the control of this fungus on grapevines to the TPa known, *inter alia*, from D1. D2 also mentions the possibility of mixing with other fungicides and also includes fenarimol in a comprehensive list but does not give any examples of mixtures. Activity against Oomycetes is not mentioned explicitly, but TP1 is found to be largely ineffective against the Oomycete *Phytophthora infestans* (see D2, pages 23-26).

D3 discloses (see the passages cited in the international search report) synergistic mixtures for controlling Oomycetes which comprise a fungicidal phenylamide, for example metalaxyl or benalaxyl, and an active substance which inhibits ergosterol synthesis, for example fenarimol.

D4 discloses (see the passages cited in the international search report) synergistic mixtures of fenarimol with amide fungicides, for example boscalid.

D5 discloses (see the passages cited in the international search report) triazolopyrimidines of a general formula under which TP1 also falls, and mentions, *inter alia*, TPa specifically, and its activity against phytopathogenic fungi.

D6 discusses (see the passages cited in the international

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search report) the activity spectrum of fenarimol and related fungicides.

D7 finally discusses (see the passages cited in the international search report) the relationship between the true fungi and the Oomycetes related to the brown algae (Phycomycetes) from a taxonomic, morphological and physiological point of view, and points out firstly differences and secondly ecological common features which are suspected to result from a convergent evolutionary development.

Inventive step

The present application meets the requirements of PCT Article 33(1) in conjunction with PCT Article 33(3) because the subject matter of claims 1-10 involves an inventive step.

In the light of the description and the closest prior art of citation D1 (or D3 or D4), the problem addressed by the application can be considered that of providing (further) synergistic mixtures of triazolopyrimidines with other fungicides, especially for controlling phytopathogenic Oomycetes (Phycomycetes).

The proposed solution is characterized by the use of the specific triazolopyrimidine TP1 in combination with fenarimol.

In order to arrive at this solution, it is necessary to select specifically that of the present application, specifically TP1, among the triazolopyrimidines of D2,

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and to use it instead of the TPa and TPc mentioned in D1 and, on top of that, to replace the ergosterol synthesis inhibitors mentioned there with fenarimol.

The closest prior art D1 teaches that triazolopyrimidines of a general formula under which TP1 also falls can display synergistic action with a series of other fungicides, also including those which, like fenarimol, inhibit ergosterol synthesis, for example triazoles such as cyproconazole and metconazole, fenpropimorph and triforine, and pyrimethanil which, like fenarimol, is a pyrimidine derivative. The preferred triazolopyrimidines TPa, TPb and TPc, which are the sole triazolopyrimidines specified fully, differ from TP1 by the substitution on the nitrogen, on the phenyl ring or on both.

Although Oomycetes such as *Phytophthora* are mentioned among the pathogens to be controlled, and the synergistic mixtures are tested on a number of harmful fungi, for example species of the *Blumeria*, *Botrytis*, *Septoria*, *Erysiphe* and *Puccinia* genera, they are not tested on an Oomycete.

The examples show, for example, synergistically enhanced action of the mixture of TPa and TPc with fenpropimorph or cyproconazole against *Leptosphaeria nodorum* (glume blotch) and *Blumeria graminis* (powdery mildew), both Ascomycetes, on wheat.

D2 specifically discloses 2,4,6-trifluorophenyltriazolopyrimidines, including TP1 (compound 2), and shows that they exhibit good activity against the Ascomycetes *Botrytis cinerea* and *Uncinula necator* (powdery mildew of grapevines) but not against the Oomycete *Phytophthora*

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infestans (see D2, pages 23-26).

Finally, D5 states explicitly (see D5, column 1 lines 29-45) that the triazolopyrimidines substituted on the nitrogen in the 7-position, which also include TP1, have a spectrum of activity different from the triazolo- and imidazolopyrimidines unsubstituted on the nitrogen in the 7-position. The latter are known to be especially active against Phycomycetes (algal fungi), for example *Plasmopara viticola* (downy mildew of grapevines, *Peronosporales*, *Oomycetes*). In contrast, the substituted analogues are effective against harmful fungi, for example *Erysiphe* (*Blumeria*) *graminis* and *Leptosphaeria nodorum*, which are not *Oomycetes*; D5 obviously refers to them erroneously as *Oomycetes* instead of "non-*Oomycetes*".

Fenarimol is also not known to be particularly effective against *Oomycetes*. On the contrary, it is said to be ineffective against *Oomycetes* as an ergosterol synthesis inhibitor, since they do not synthesize sterols (D3, page 2 lines 3-17; and also D7). When fenarimol does also exhibit action against *Oomycetes* in addition to the action against *Ascomycetes*, *Deuteromycetes* and *Basidiomycetes* as a result of a secondary mechanism of action, it is comparatively small (see D6).

If anything, the agent in the selection for controlling *Oomycetes* is phenylamide fungicides such as metalaxyl and benalaxyl, which, however, can surprisingly nevertheless display synergistic action against *Oomycetes* with ergosterol synthesis inhibitors (see D3).

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Proceeding from D3, a person skilled in the art would have to exchange precisely the phenylamides which are known to be active against Oomycetes for TP1 which, though, according to D2, has no effect against *Phytophthora infestans* (Oomycetes).

Proceeding from D4, finally, the amides used there would have to be exchanged for TP1. The prior art gives no incitement to do this, let alone render it obvious that this would lead to the solution of the problem of the invention.

D4 lists the phytopathogenic fungi for whose control these mixtures are especially suitable, which do include, *inter alia*, *Plasmopara viticola* (downy mildew) on grapevines, and the list is largely identical to that of the present application (compare D4, page 10 line 24-page 11 line 6 with the description page 3 lines 4-28; it should also be noted that *Cercospora arachidicola* is the anamorph to *Mycosphaerella arachides*, and *Helminthosporium oryzae*, *Bipolaris oryzae* and *Drechslera oryzae* all appear to be synonyms for the *Cochliobolus miyabeanus* species), but the mixtures are significantly tested only against *Puccinia recondita* (leaf rust of wheat, *Basidiomycetes*).

The synergistically enhanced action demonstrated for the claimed mixtures against Oomycetes is therefore surprising and is a convincing indication of the involvement of an inventive step.

Industrial applicability

The subject matter of claims 1-10 is considered to be

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industrially applicable (PCT Article 33(1) and (4)).